

Addiction and the female brain

by

Jeffrey Georgi, M.Div., MAH, LCAS, CGP
Consulting Associate Faculty

Division of Addiction Research and Translation

Duke University Medical Center

Georgi Educational and Counseling services

jeff@georgicounseling.com

919-286-1600



© GECS 2015

and the end of all our exploring

will be to arrive where we started

and Know the place for the first time TM

© GECS

Women's brains the obvious

- Women's brains are part of women's bodies.
- Women's bodies are supported by a complex web interconnected relationships.
- Women's relationships fall within a social and historical context.
- The complexity of the female brain's neural net and it's virtually infinite relational and cultural tapestry defies definition.
- Our task during this workshop is inherently reductionistic.

© GECS

Biological+Psychological+Social+Spiritual
 Vulnerability Liability Context Bankruptcy

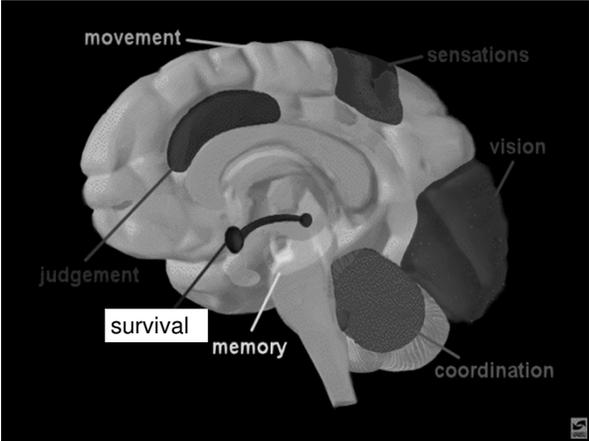
plus

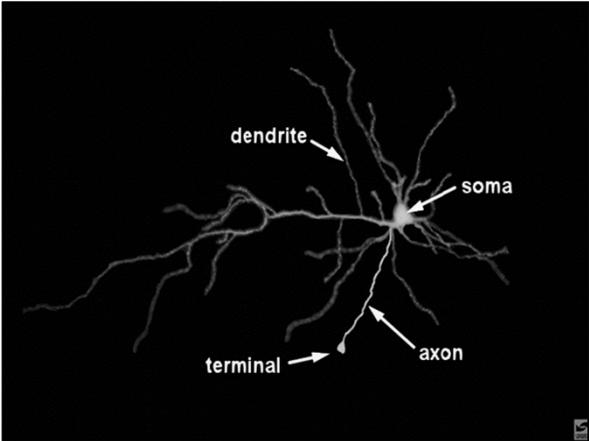
experience/relationships

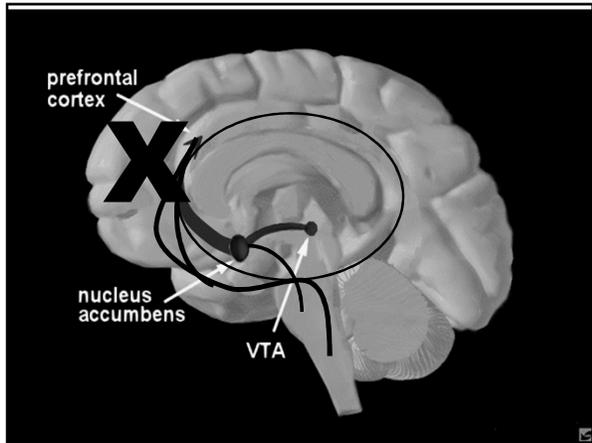
equals

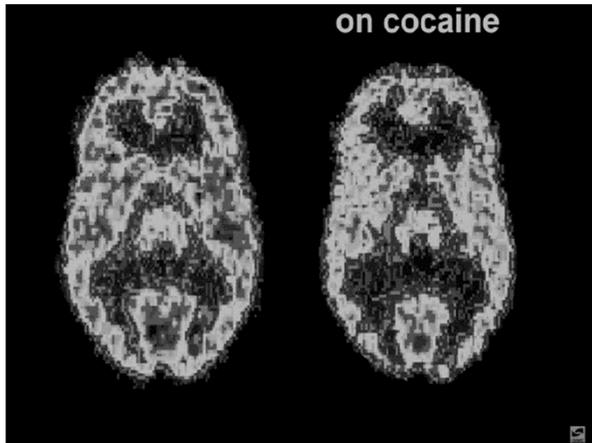
Addiction

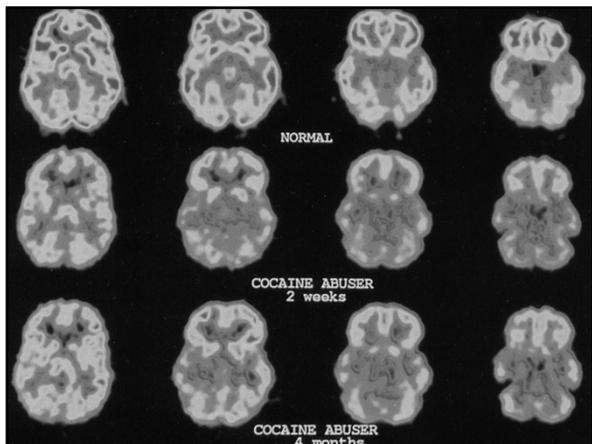
© GECS

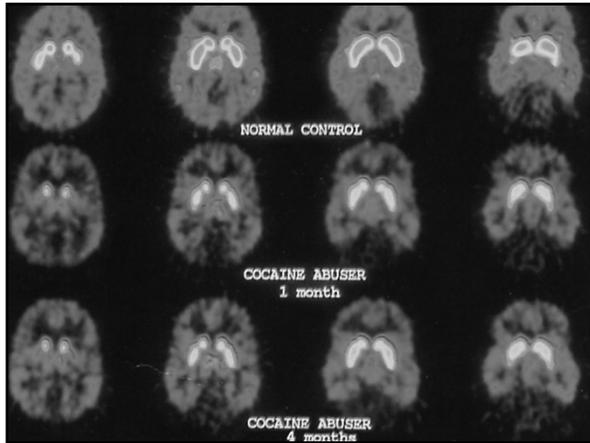








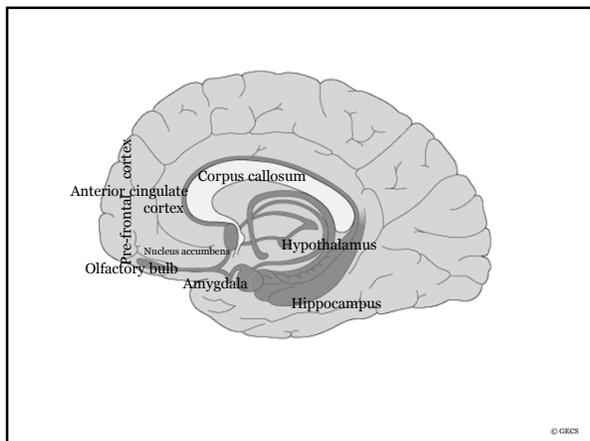




Other Suggestions

- Disease makes good people make mistakes – they still are good people but need to be held accountable
- Willpower will not work over time
- The limbic system is not reasonable
- Addiction is not a choice
- Addiction makes almost any psychiatric disorder more difficult and more dangerous

© GECS



© GECS

Women's brains general principles

- Structurally the differences between the male and female brain are real but they are subtle and important.
- Areas where there are differences matter and need to be addressed clinically.
- Differences expressed through relationships
- Neurohormonal differences are extremely important

© GECS

Women's brains

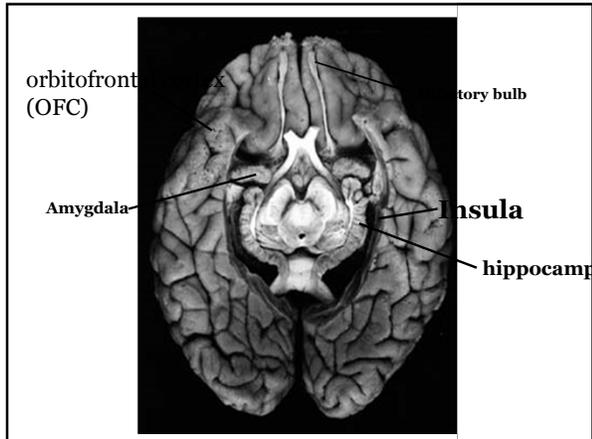
- A greater understanding of the female brain may help us illuminate clinical issues – do not confuse understanding wisdom.
- Adding to the complexity of the task is the ever changing landscape of the female's hormonal world.
- The Lawrence Summers controversy Harvard
- “We teach our boys explore and seek novelty, we teach our girls to avoid risk” (Howard Georgi, III, 2006)

© GECS

Women's brain geography

- Amygdala – smaller
- Linguistic center in the right and left Neocortex
- Amygdala, hippocampus, and hypothalamus affected by estrogen and progesterone (Sapolsky)
- Olfactory bulb – greater sensitivity
- Insula and anterior cingulate cortex (larger and more reactive)

© GECS



Women's brain geography

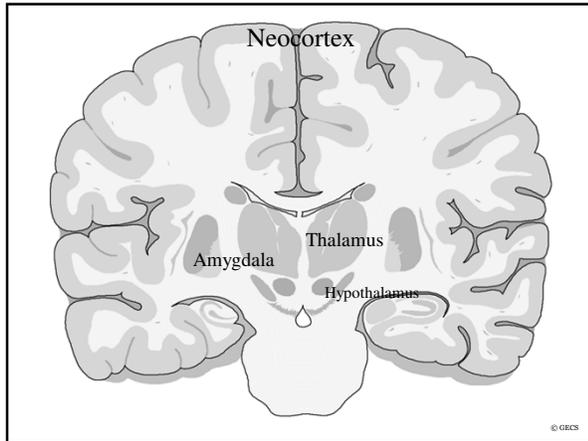
- Hippocampus may be relatively larger and form stronger synaptic connections – clearer memories pleasant and unpleasant
- Amygdala hypothalamic circuit less reactive (once activated the irritation turns to fury)
- There is greater hemispheric balance particularly in the area of language.
- The corpus callosum is enriched in women

© GECS

Women's brains / Men's brains

- Based on the above is possible to infer that women have greater relational capacity.
- Men have reduced emotional availability.
- Male hemispheric activity seems to be more distinct.
- Men have greater spatial awareness than women.
- Men tend to be more physically aggressive which may be related to testosterone

© GECS



Women's lifecycle

- Fetal
- Childhood
- Puberty
- Adolescence
- Maturing single woman
- Pregnancy and the Mommy brain
 - Breast-feeding
 - Child-rearing
- Perimenopause
- Menopause
- Post-menopause*

© GECS

Women's brains

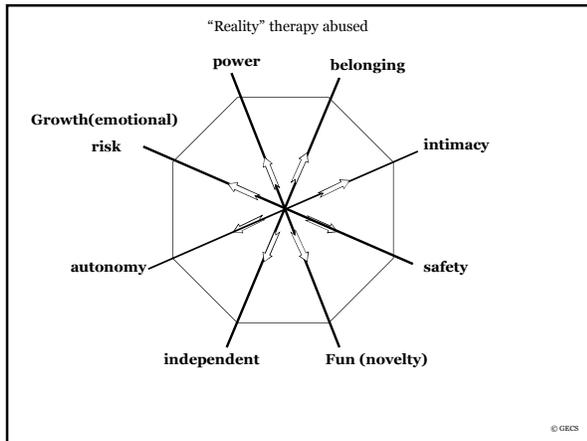
- Girls are born with a relational bias (more responsiveness to facial tracking)
- In the first three months of life the ability to visually connect increases within the female brain by a factor of 4
- The male brain shows little change

© GECS

Women's brains

- She is far more attuned to the emotional environment in which she lives
- Women have greater availability to emotional awareness. (Pinker, 1999)
- Her early capacity for empathy “absorbs her mother’s world into her own”
- Because relationships define her world connections must be defended
- For roughly the first 10 years of life a girls brain is honing its resonance to the emotional world she inhabits

© GECS



© GECS

Women's adolescent brains

- Given that a developing female brain seeks to resolve relational conflict – adolescence is a headfirst dive into relational warfare
- Combine this with the flux of estrogen and progesterone and you have a new definition of hell.
- As they move into adolescence the “energy” in the NA drops – decrease in dopamine levels (White,2003).
- Kids need more external stimulation to activate the NA which leads to risk taking.

© GECS

Women's adolescent brains

- Adolescents often look bored and depressed.

© GECS

Women's brains

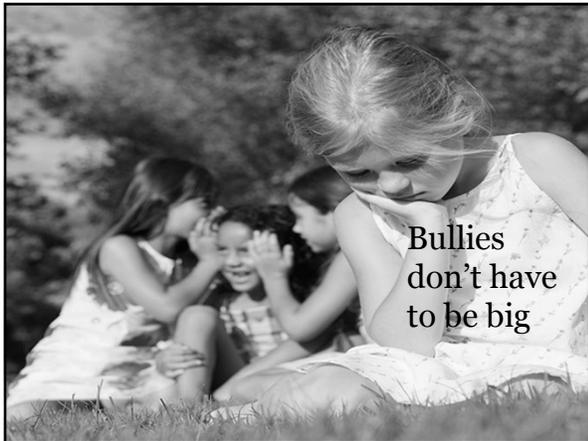
- Social and verbal connections are hardwired into the female brain.
- Sharing secrets and talking about relationships bathes the brain in a dopamine and creates an oxytocin rush.
- Connection soothes— rejection equals death
- A woman intimate relationship equals her aliveness (mirror neurons) - **Empathy**

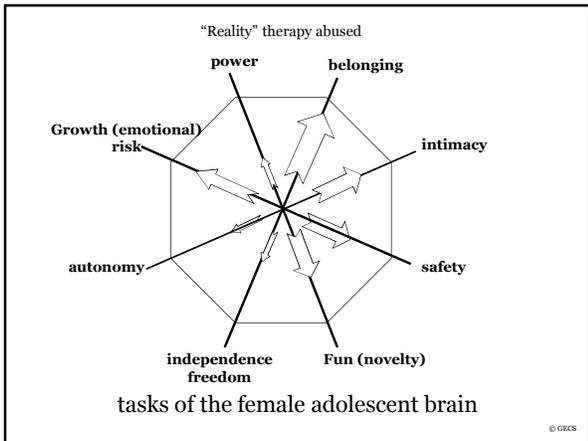
© GECS

Women's brains

- Sympathetic nervous system responds, affiliate and negotiate or “tend and befriend”
- One reason girls find it unbearable when they feel they're being “left out.”
- Here in lies the power of feminine bullies.
- Relational viciousness can be more brutal than physical assault

© GECS





- ### Adolescent treatment issues
- Defend against the bully
 - Detoxify trauma
 - Help to build healthy relationships
 - Address sexuality
 - Create safety
 - Address family issues
 - Develop a recovering community
- © GECS

Relational tapestry of treatment

- Women are born into a world defined by relationships.
- Her dominant role in life is to create, expand, protect and nurture the relationships in her world.
- Her entry into addiction stems from a fundamental breach of relational attachment.
- Her drug addiction is her attempt to heal this profound breach.

© GECS

Relational tapestry of treatment

- Content is important, particularly in early recovery. However, process interventions should not be overlooked.
- Before a woman can love herself she must be loved unconditionally by another.
- Issues of relational connection; mother to child, daughter to father, sister to sister, wife to life partner, friend to friend, must be supported.
- Don't forget family.

© GECS

Relational tapestry of treatment

- The therapeutic relationship is of primary importance.
- "Play" and fun in addition to spontaneity and sexuality need to be addressed in treatment.
- Group interventions need to be safe and bring the patients into the "here and now"
– use a modified interpersonal group process.

© GECS

Relational tapestry of treatment

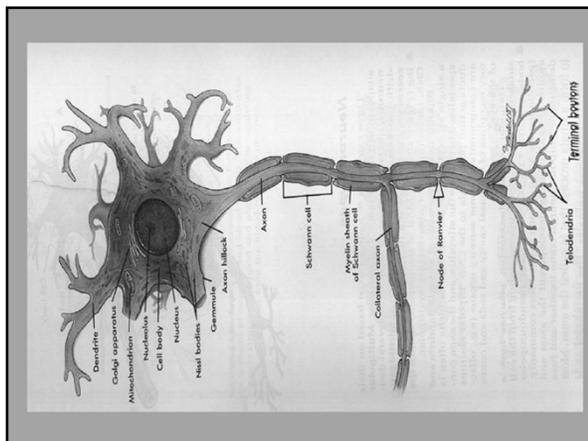
- Emphasis needs to be placed on strengths and competence not just on the problems.
- We need to re-introduce the word “love” into our clinical practice.
- Need is shame based, particularly in relationships and personal aspirations.
- Wanting is more motivating than needing.
- Love is more relational and more powerful than shame.

© GECS

Women’s brains

- There are four times in a woman’s lifecycle when her axon hillock (the gatekeeper) becomes more sensitive (Sapolsky).
- Puberty
- Premenstrual
- Postpartum
- Peri-menopause
- (“During menopause a woman loses her eggs but finds her balls.” C. Northrop)

© GECS



Women's brains Estrogen

- 25% growth in connections in the hippocampus during the first two weeks the estrogen phase (Sapolsky)
- Progesterone begins to reverse these connections, more irritable, more reactive
- Fourth week in the cycle estrogen and progesterone bottom out (hormonal withdrawal)

© GECS

Women's brains Estrogen

- High levels of estrogen and progesterone create a brain that is stress resilient with more than enough serotonergic activity
- The opposite is true – premenstrual dysphoric disorder

© GECS

Women's brains PDD Sapolsky

- She lives with a greater sense of urgency.
- Her entire system is vigilant and alert.
- She sees things and attends to issues that at other times she might be able to overlook.
- She is more sympathetically sensitive.
- She is more prone to depression.
- Her brain may be looking for ways to calm itself down.
- Affective modulation is more difficult.

© GECS

Women's brains Falling In Love Ames

- Only form of socially accepted psychosis
- A limbic system out of control
- Obvious flaws are overlooked
- Limbic resonance clouds clarity
- Reality is distorted “your judgment is toast”
- Libidinal energy is dramatically increased
- It is not an emotion but a drive
- Hijacks the primary motivational system

© GECS

Women's brains Falling In Love

- Certain nuclei in the amygdala activate and others turn off Sapolsky
- The anterior cingulate cortex loses energy
- Significant increases in dopamine, estrogen, oxytocin, and testosterone – a lethal mix
- Romantic partners “crave” the ecstatic feeling of being together (not dissimilar to addiction)
- Physical separation is painful
- Physical closeness is perceived as a need

© GECS

Women's brains Being in Love

- Some neurophysiologist's believe that the “attachment network” is a separate system from those activated by falling in love (Howard)
- More “parasympathetic” – peaceful, calming, and connecting.
- The development of long-term commitment and bond maintenance
- Oxytocin and estrogen remain high
- “Cuddling” continues to release oxytocin

© GECS

Women's brains Being in Love

- The prairie vole versus Montane vole
- During the “in love” phase stress can lead to sex in men
- Stress extinguishes the fires of passion in women
- The loss of love leads to interruptions in sleep, work, concentration, social activities, in other words DEPRESSION.
- Grief is unavoidable

© GECS

Women's brains “The Mommy Brain” Brizendine

- Disclaimer – I have never given birth nor been pregnant
- The modern woman is often caught between profession and motherhood
- If motherhood wins out her brain is forever changed
- Just being around babies can create a “baby lust”
- Smell is often a trigger for “baby lust”

© GECS

Women's brains “The Mommy Brain” Brizendine

- Once pregnant the woman's progesterone levels start to climb.
- High levels of progesterone and estrogen help to offset the natural stresses of pregnancy.
- By the end of pregnancy or cortisol levels are as high as if she were participating in a triathlon.
- The child is born and oxytocin takes over

© GECS

Women's brains
"The Mommy Brain" Brizendine

- Because of her higher levels of connection her fear declines, her focus sharpens and she is prepared to defend her child.
- Shortly after birth and the initiation of breast-feeding mother's brain scan would look very similar to the brain scan of a woman under the spell of romantic love.
- She is no longer the same.
- If she continues to nurse the spikes in oxytocin are as reinforcing than cocaine

© GECS

Women's brains
"The Mommy Brain" Brizendine

- Mothers will experience withdrawal if separated from their child
- From an "epigenetic" point of view mothers "inherit their maternal style from their primary caregivers."
- Fortunately other loving "substitute caregivers" matter
- If a mother or her child did not receive adequate maternal care they are excessively responsive to stress

© GECS

Women's brains
"The Mommy Brain" Brizendine

- In an unpredictable environment mothers become fearful and timid and babies become depressed
- It is no small wonder that fathers often experience jealousy and a loss of their relational position.
- Geared to her child's needs the mothers emotional sensitivity increases.
- Her limbic system is even more responsive and intuitive

© GECS

Women's brains
"The Mommy Brain" Brizendine

- Empathy deepens
- The limbic connection (resonance) between the mother and child strengthens
- The amygdala, hippocampus and hypothalamus become the early defense warning and response mechanisms
- The "mommy brain" is on guard.

© GECS

Women's brains
"The Mommy Brain" and failed attachment

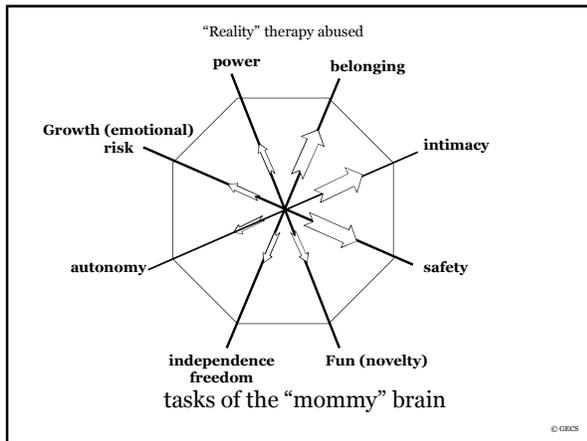
- The importance of grandmothers and other surrogate caregivers (Pinker)
- Despite the best intentions our children often do not receive good enough parenting
- The mother and her child are not valued by our culture
- The mother/child system and the entire culture plays an enormous price
- The cost - **failed attachment**

© GECS

Women's brains
"The Mommy Brain" and failed attachment

- The mother feels inadequate
- Her baby feels insecure and in search of the love object
- The love hungry brain must be fed
- Anxiety and depression are but a few of the symptoms
- In the absence of the maternal bond the child is on a lifelong quest to fill the void
- Sadly, drugs and alcohol will do

© GECS



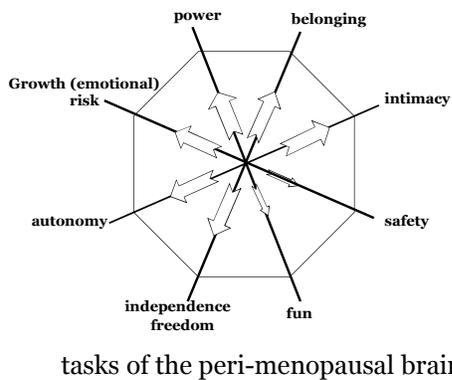
- ### Mother’s/children and treatment
- Define the treatment unit as the mother/child relationship
 - Rebuild the broken bonds between mother and child
 - Addiction, an attachment disorder
 - Shame
 - Family
 - Develop a recovering community
- © GECS

- ### Women’s brains
- Alcohol dependent women have higher heart rate in response to the initial consumption of alcohol
 - Women exhibit a greater sense of well-being following the use of cocaine (McCance-Katz, 2005)
 - Women’s brains are more responsive to nicotine in the cortical and subcortical prefrontal systems (Fallon, 2006)
 - Nicotine remains the number one drug of abuse when it (Kandel, 1998)
- © GECS

Women's brains

- Women are 55% more likely to abuse a prescription drugs particularly narcotic anti-anxiety medications
- Between the ages of 12 to 17 female risk for non-medical abuses of prescription medications, particularly in its analgesics, increases even more than me above. (NSDUH 2001)

© GECS



© GECS

Women's brains Perimenopause

Brizendine

- Perimenopause can last as long as 10 years
- For some women these symptoms are annoying for others they are debilitating
- Anxiety, depression, night sweats, hot flashes, panic attacks, insomnia, memory challenges, irritability, hypervigilance, "perimenopause is like adolescence—without any of the fun."

© GECS

Treatment for women in perimenopause

- Help to stabilize perimenopause symptoms
- Address shame
- Emphasis on mindfulness and exercise
- Develop the recovering community
- Move towards greater self-definition
- Focus on competencies
- Address grief, loss and mourning

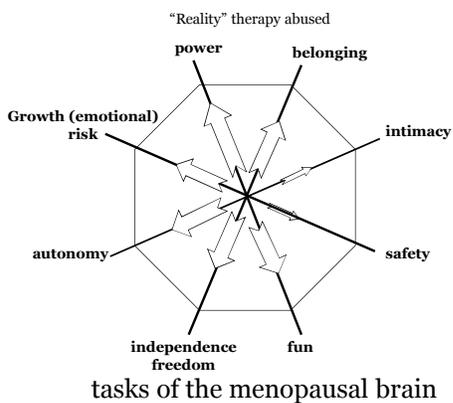
© GECS

Women's brains

- Estrogen stimulates the immune response
- Chronic alcohol exposure causes an initial increase in estrogen levels followed by a marked decrease (Wu, et al. 2002)
- Female immune suppression over time is greater because of the decrease in estrogen and the increase in glucocorticoids.

■ **Stress!**

© GECS



© GECS

Women's brains

Menopause

- Empowerment, change, and the unknown
- 65% of divorces after the age of 50 are initiated by women
- The female brain is not ready to retire
- The emotional fuel of estrogen wanes
- The mature female brain is still relatively unknown territory
- Respect the power of grandmothers
- Respect the power of possibility

© GECS

Treatment issues for women in menopause

- Address shame
- Address grief, loss and mourning
- Emphasis on mindfulness and exercise
- Develop the recovering community
- Move towards greater self-definition
- Focus on competencies and feminine power
- Address issues of legacy and meaning

© GECS

Women's brains

Clinical implications?

Clinical challenges?

© GECS

“What we call the beginning is
often the end.

And to make an end is to
make a beginning.

The end is where we
start from.”

T. S. Elliot

© GECS

Recommended reading and partial bibliography

- Amen, Daniel G., Sex on the Brain, Three Rivers Press, NY, NY 2007
- Andreasen, Nancy C., Brave New Brain : Conquering Mental Illness in the Era of the Genome, Oxford Press, New York, 2003
- Brizendine, Louunn, The Female Brain, Random House, Inc., New York, New York, 2006
- Goleman, Daniel, Social Intelligence: The Revolutionary New Science of Human Relationships, Bantam Books, 2006
- LeDoux, Joseph, The Synaptic Self: How Our Brains Become Who We Are, Viking Penguin, New York, NY, 2002
- LeDoux, Joseph, The Emotional Brain: the Mysterious Underpinnings of Emotional Life, Viking Penguin, New York, NY, 1999.
- Lewis, Thomas, A General Theory of Love, Vintage Press, New York, NY 2001
- Pert, Candace B., Molecules of Emotion: the Science Behind Mind-Body Medicine, Scribner NY, NY, 1997
- Northrup, Christiane, Women's Body, Women's Wisdom, Creating Physical and Emotional Health and Healing, Bantam, 2001
- Howard, Pierce J., The Owner's Manual for the Brain, Bard Press, Austin, TX, 2006
- Pert, Candice B., Molecules of Emotions: the Science behind Mind-Body Medicine, Scribner, New York, NY, 1997
- White, Aaron, Keeping Adolescence Healthy, BookSurge Publishing, Charleston, SC, 2008

© GECS
